

## REMARKS

### I. PENDING CLAIMS AND SUPPORT FOR AMENDMENTS

Upon entry of the present amendment, claims 8-5 will be pending in this application.

Applicants have amended claim 8 to clarify that the  $P_2O_5$  former, the  $B_2O_3$  former, or both are introduced into the fiber composition, thereby providing an unambiguous recitation of a positive process step, and resolving any perceived ambiguity as to whether both the  $P_2O_5$  former and the  $B_2O_3$  former are required. Support for this can be found in Table II in the specification, as pointed out in the previous Office action.

Since this amendment does not raise any new issues requiring further consideration and/or search, but instead merely implements suggestions made by the Examiner and removes issues, placing the application in condition for allowance or better form for appeal, its entry is appropriate under 37 C.F.R. § 1.116, and is respectfully requested.

### II. REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

In paragraph 3 of the Office action, the Examiner has again rejected claims 8-12 as being indefinite under 35 U.S.C. § 112, second paragraph. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The Examiner contends that claims 8-12 lack an active process step, because they use the term “including” instead of “adding” or “putting.” Applicants have

amended claim 8 to replace the "including" terminology with "adding" terminology, as suggested by the Examiner.

In addition, the Examiner has asserted that the claims are unclear as to whether both  $P_2O_5$  former and  $B_2O_3$  former are required in the composition. Applicants have amended the claims to clarify that this is not the case.

Applicants submit that the claim language clearly delineates the metes and bounds thereof, and that the claims are unambiguous and in compliance with 35 U.S.C. § 112, second paragraph. Accordingly, the Examiner's rejection should be withdrawn.

### III. REJECTIONS UNDER 35 U.S.C. § 102

#### A. Jensen et al.

In paragraph 5 of the Office action, the Examiner has again rejected claims 8-15 as anticipated by Jensen et al. (U.S. Patent Nos. 5,691,255; 5,614,449; WO 95/29135). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

As Applicants argued in their previous response, Jensen et al. is concerned with non-refractory uses of their vitreous fiber. While the Examiner is correct that "a reference may be used for all it realistically teaches," the claims at issue recite a method for increasing the refractoriness of inorganic fibers. Jensen et al. does not disclose or even suggest that inclusion of  $P_2O_5$  former,  $B_2O_3$  former, or both, in the recited amounts, will produce inorganic fibers having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours. That Jensen et al. failed

to recognize any connection between the presence of the claimed amounts of  $P_2O_5$  former,  $B_2O_3$  former, or both is evidenced by the disclosure in Jensen et al. of other compositions that do not contain such formers, or are outside the claimed ranges, but that are acceptable for the purposes of Jensen et al.

Because an anticipatory reference must teach, within its four corners, every limitation of the claim, and because Jensen et al. clearly fails to provide any teaching of increasing the refractoriness of inorganic fibers, Applicants respectfully submit that the Examiner's rejection should be withdrawn.

B. Thelohan et al.

In paragraph 6 of the Office action, the Examiner has rejected claims 8, 9, 13, and 14 as anticipated by Thelohan et al. (U.S. Patent Nos. RE 35,557 and 5,250,488). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The Examiner asserts that "the mere presence of the claimed compounds would inherently increase the refractoriness of the fiber." However, as pointed out above, the claims are directed methods for increasing the refractoriness of the fiber. Absent some recognition that the fibers involved were, in fact, refractory fibers, the Examiner's theory of inherency fails. The Examiner asserts that "heat resistance test[s] were taken so refractoriness must have been a concern." However, the fibers of Thelohan et al. were used to insulate ducts, grills, and the like. As the Examiner is no doubt well aware, there is a world of difference between insulating a heating duct, in, e.g., a residential home and insulating the inner surfaces of a kiln or furnace. The fibers used in these applications are very different, and require very different

properties. Absent disclosure or recognition of the relationship between the presence of  $P_2O_5$  former and increased refractoriness in the fiber of Example 3, Applicants submit that it is incorrect for the Examiner to assert that a reference to household ductwork insulation anticipates claim 8, which recites increasing the refractoriness of inorganic fibers so as to produce fibers having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours.

With respect to fiber claims 13 and 14, Applicants note that these claims recite lower limits on concentration of CaO that are well above the amount of CaO present in Example 3 of Table 1 of Thelohan. Accordingly, there can be no anticipation of these claims.

C. Karppinen et al.

In paragraph 7 of the Office action, the Examiner has rejected claims 8-15 as anticipated by Karppinen et al. (U.S. Patent No. 5,843,854 and WO 92/09536). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

Applicants have argued that Karppinen et al., like Jensen et al. and Thelohan et al., does not teach or suggest that adding phosphate, borate, or both to inorganic fibers will increase refractoriness of the fibers, producing fibers having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours. In response, the Examiner asserts that “the method steps only require the mere presence or

inclusion of certain compounds.” As indicated above, Applicants have amended claim 8 so that this is not even arguably the case.

Moreover, as with Thelohan et al., use of a fiber “for heat insulation,” the use specifically relied upon by the Examiner, is a far cry from use as a refractory fiber. Applicants have previously pointed out that Karppinen et al. is concerned with providing insulation against the type of heat and sound required in the construction industry, and with increasing saline solubility of the fibers, not with providing refractory insulation suitable for the inside of a furnace or kiln. These two types of insulation are fundamentally different, and in making his anticipation rejections, the Examiner has failed to account for this difference.

Because, like Jensen et al. and Thelohan et al., Karppinen et al. fails to teach or suggest all of the limitations of Applicants’ claims, it does not anticipate the claims, and the rejection should be withdrawn.

D. Olds et al.

In paragraph 8 of the Office action, the Examiner has rejected claims 8-10, 12, and 14 as anticipated by Olds et al. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

The Examiner apparently agrees that language reciting that one or the other of phosphate or borate is present in the fiber would remove this rejection. All of the rejected claims recite this language, either directly, or by incorporation of the limitations of the claims from which they depend. Accordingly, the Examiner’s rejection should be withdrawn.

E. Holstein et al.

In paragraph 9 of the Office action, the Examiner has rejected claims 8-15 as anticipated by Holstein et al. (U.S. Patent Nos. 6,060,414; 6,037,284; and WO 93/22251). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

As with Jensen et al., Thelohan et al., and Karppinen et al., Applicants have argued that Holstein et al. is silent with respect to any increase in refractoriness resulting from adding phosphate or borate formers to the fiber composition. The Examiner has replied that the method claims merely require the presence of these components in the composition. However, the claims clearly recite adding one or both of these components to the composition so as to obtain a fiber having increased refractoriness, more specifically, having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours. Holstein et al. is silent in this regard.

With regard to the fiber claims, the Examiner has failed to establish any likelihood that the fibers recited in Table 1 of Holstein et al. will possess the shrinkage characteristics recited by the claims. Certainly no shrinkage results are presented in Holstein et al. Moreover, the Holstein et al. fibers possess varying amounts of materials not disclosed in Applicants' specification as being present in fibers having the desired shrinkage characteristics, such as TiO<sub>2</sub>. The Examiner's apparent conclusion that the fibers of Holstein et al. would inherently possess the shrinkage characteristics recited in the claims is therefore based on mere speculation.

In light of the above comments, the Examiner's anticipation rejection should be withdrawn.

F. Jubb et al.

In paragraph 10 of the Office action, the Examiner has rejected claims 8-10, 12, and 14 as anticipated by Jubb et al. (WO 93/15028). Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.


The Examiner alleges that the compositions of Table 10 fall within the scope of the claims that do not require the presence of phosphorus. As described above, the claims recite the presence of phosphate or borate formers, or both, to increase refractoriness in inorganic fibers. The compositions of Table 10 of Jubb et al. contain neither phosphate nor borate. Accordingly, Jubb et al. cannot teach or suggest methods for increasing refractoriness by including phosphate or borate formers in the glass composition. As a result, Jubb et al. does not anticipate the claims, and the Examiner's rejection should be withdrawn.

Applicants respectfully submit that the claims are in condition for immediate allowance, and an early notification thereof is earnestly solicited. If the Examiner believes that any issues remain to be resolved, he is requested to contact the undersigned at 404.815.6218 prior to issuance of any Advisory Action so that said issues can be addressed.

Please charge any fees or credit any overpayment to Deposit Order Account

No. 11-0855.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'Bruce D. Gray', written over a horizontal line.

Bruce D. Gray  
Reg. No. 35,799

Date: October 8, 2002

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## MARKED UP COPY OF AMENDED CLAIMS

8. (Twice Amended) A method of increasing the refractoriness of inorganic fibers having a composition containing SiO<sub>2</sub> and CaO, or SiO<sub>2</sub>, CaO, and MgO, comprising adding to the fiber composition a P<sub>2</sub>O<sub>5</sub> former, a B<sub>2</sub>O<sub>3</sub> former, or both:

(1) [including in the fiber composition a] wherein any P<sub>2</sub>O<sub>5</sub> former is added in an amount such that:

(a)  $\{\text{SiO}_2\} + (\{\text{P}_2\text{O}_5\} - (58 + 0.5(\{\text{MgO}\} - 10))) > -2.4 \text{ wt\%}$  if  $\{\text{MgO}\} > 10 \text{ wt\%}$ ; and

(b)  $\{\text{SiO}_2\} + (\{\text{P}_2\text{O}_5\} - 58) > -2.4 \text{ wt\%}$  if  $\{\text{MgO}\} \leq 10$ ; and optionally

(2) [including in the fiber composition a] wherein any B<sub>2</sub>O<sub>3</sub> former is added in an amount such that  $\{\text{B}_2\text{O}_3\}$  is in the range from 0 to 4 wt%;

wherein  $\{\text{SiO}_2\}$ ,  $\{\text{P}_2\text{O}_5\}$ ,  $\{\text{MgO}\}$ , and  $\{\text{B}_2\text{O}_3\}$  are the concentrations of SiO<sub>2</sub>, P<sub>2</sub>O<sub>5</sub>, MgO, and B<sub>2</sub>O<sub>3</sub>, respectively, in the fiber in wt%;

thereby producing inorganic fibers having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours.

14. (Amended) A saline soluble inorganic fiber having a shrinkage of less than 3.5% when exposed to a temperature of 1000 °C for 24 hours and having a shrinkage of less than 3.5% when exposed to a temperature of 800 °C for 24 hours, comprising SiO<sub>2</sub>, CaO, MgO, and [optionally] one or both of P<sub>2</sub>O<sub>5</sub> and B<sub>2</sub>O<sub>3</sub> in concentrations falling within the ranges:

$\{\text{SiO}_2\}$	44.34 wt% to 62.48 wt%;
$\{\text{CaO}\}$	20.36 wt% to 39.4 wt%;
$\{\text{MgO}\}$	0.62 wt% to 21.16 wt%;
$\{\text{P}_2\text{O}_5\}$	0 wt% to 12.01 wt%;
$\{\text{B}_2\text{O}_3\}$	0 wt% to 3.54 wt%;

wherein  $\{\text{SiO}_2\}$ ,  $\{\text{CaO}\}$ ,  $\{\text{MgO}\}$ ,  $\{\text{P}_2\text{O}_5\}$ , and  $\{\text{B}_2\text{O}_3\}$  are the concentrations of SiO<sub>2</sub>, CaO, MgO, P<sub>2</sub>O<sub>5</sub>, and B<sub>2</sub>O<sub>3</sub>, respectively, in the fiber, and wherein

(a)  $\{\text{SiO}_2\} + (\{\text{P}_2\text{O}_5\} - (58 + 0.5(\{\text{MgO}\} - 10))) > -2.4 \text{ wt\%}$  if  $\{\text{MgO}\} > 10 \text{ wt\%}$ ; and

(b)  $\{\text{SiO}_2\} + (\{\text{P}_2\text{O}_5\} - 58) > -2.4 \text{ wt\%}$  if  $\{\text{MgO}\} \leq 10$ .